

ANNALS *of* PHYSICS

Editor

Herman Feshbach

Assistant Editors

A. Dalgarno

Roman W. Jackiw

Henry Ehrenreich

Arthur M. Jaffe

Editorial Council

A. Arima

L. Kadanoff

R. V. Pound

D. Brink

S. E. Koonin

D. Scalapino

S. Deser

Y. Nambu

F. Wilczek

J. Eisenberg

L. Okun

C. M. Will

J. A. Golovchenko

J. P. Ostriker

K. Wilson

Founding Editors

Philip M. Morse

Bernard T. Feld Herman Feshbach Richard Wilson

VOLUME 217 • 1992



ACADEMIC PRESS, INC.

Harcourt Brace Jovanovich, Publishers

San Diego New York Boston

London Sydney Tokyo Toronto

Copyright © 1992 by Academic Press, Inc.

ALL RIGHTS RESERVED

No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopy, recording, or any information storage and retrieval system, without permission in writing from the copyright owner.

The appearance of the code at the bottom of the first page of an article in this journal indicates the copyright owner's consent that copies of the article may be made for personal or internal use, or for the personal or internal use of specific clients. This consent is given on the condition, however, that the copier pay the stated per copy fee through the Copyright Clearance Center, Inc. (27 Congress Street, Salem, Massachusetts 01970), for copying beyond that permitted by Sections 107 or 108 of the U.S. Copyright Law. This consent does not extend to other kinds of copying, such as copying for general distribution, for advertising or promotional purposes, for creating new collective works, or for resale. Copy fees for pre-1992 articles are as shown on the article title pages; if no fee code appears on the title page, the copy fee is the same as for current articles.

0003-4916/92 \$9.00

This journal is printed on acid-free paper.



Printed by Catherine Press, Ltd., Brugge, Belgium

CONTENTS OF VOLUME 217

NUMBER 1, JULY 1992

YA. I. GRANOVSKII, I. M. LUTZENKO, AND A. S. ZHEDANOV. Mutual Integrability, Quadratic Algebras, and Dynamical Symmetry	1
ÖMER F. DAYI. Collective Coordinates and Constrained Hamiltonian Systems	21
CARL B. DOVER AND HERMAN FESHBACH. Unitary Symmetry in Baryon-Baryon Scattering, II	51
D. ELIEZER AND G. W. SEMENOFF. Anyonization of Lattice Chern-Simons Theory	66
C. YANNOULEAS AND R. A. BROGLIA. Landau Damping and Wall Dissipation in Large Metal Clusters	105
STEVEN GOLOWICH AND JOHN Z. IMBRIE. A New Approach to the Long-Time Behavior of Self-Avoiding Random Walks	142
ABSTRACTS OF PAPERS TO APPEAR IN FUTURE ISSUES	170

NUMBER 2, AUGUST 1, 1992

A. HEIL, A. KERSCH, N. A. PAPADOPOULOS, AND B. REIFENHÄUSER. Abelian Charges in a Nonabelian Yang-Mills Theory from the Stratification of the Space of Gauge Potentials.	173
STEFANO BELLUCCI, EVGENYI IVANOV, AND SERGEY KRIVONOS. $N=2$ Chiral Bosons in Superspace	194
A. STEYERL AND S. S. MALIK. Possible Implications of Exponential Decay	222
F. CARSTOIU AND R. J. LOMBARD. A New Method of Evaluating Folding Type Integrals	279
PER ELMFORS AND BO-STURE SKAGERSTAM. Quantum Fields at Local Equilibrium and Distortions of the Cosmic Microwave Background	304
J. ERLER, D. JUNGnickEL, J. LAUER, AND J. MAS. String Emission from Twisted Sectors: Cocycle Operators and Modular Background Symmetries	318
ABSTRACTS OF PAPERS TO APPEAR IN FUTURE ISSUES	364
AUTHOR INDEX FOR VOLUME 217	367

Annals of Physics

INFORMATION FOR AUTHORS

Annals of Physics is devoted to the publication of papers describing original work in all areas of basic physics research. Original papers only will be considered. Manuscripts are accepted for review with the understanding that the same work has not been published, that it is not under consideration for publication elsewhere, and that its submission for publication has been approved by all of the authors and by the institution where the work was carried out; further, that any person cited as a source of personal communications has approved such citation. Written authorization may be required at the Editor's discretion. Articles and any other material published in *Annals of Physics* represent the opinions of the author(s) and should not be construed to reflect the opinions of the Editor(s) and the Publisher.

Authors submitting a manuscript do so on the understanding that if it is accepted for publication, copyright in the article, including the right to reproduce the article in all forms and media, shall be assigned exclusively to the Publisher. The Publisher will not refuse any reasonable request by the author for permission to reproduce any of his or her contributions to the journal.

Manuscripts should be submitted to the Editor:

Dr. Herman Feshbach
Annals of Physics
Room 6-318A
Massachusetts Institute of Technology
Cambridge, Massachusetts 02139, U.S.A.

Form of Manuscript: Submit manuscripts in duplicate—either the original (typewritten or printed) manuscript and one copy or two clear, even-density photocopies, preferably triple-spaced but at least double-spaced—on one side of 8.5 × 11-inch white paper, and leave wide margins. For longer papers, if it is convenient, one of the two copies should be double-sided. Number each page. Page 1 should contain the article title, author and coauthor names, complete affiliation(s) (name of institution, city, state, and zip code), and a short abstract. Also place on page 1 any footnotes to the title (indicated by superscript *, †, ‡). At the bottom of page 1 note the number of manuscript pages, figures, and tables. Page 2 should contain a proposed running head (abbreviated form of the title) of less than 35 characters. It should also contain the name and mailing address of the author to whom proofs should be sent. Include telephone, fax, and electronic mail contact information, if available. A copy of the title page with the abstract and a copy of the reference page(s) should be submitted in addition to the two complete manuscripts.

Personal computer disks. Manuscripts may be submitted to *Annals of Physics* on personal computer disks after the manuscript has been accepted and after all revisions have been incorporated onto the disk. Label the disk with the type of computer used, the type of software and the version number, and the disk format. All tabular material will be typeset conventionally. Art must be prepared as camera-ready copy; see the section on Figures below in this Information for Authors.

A hard copy printout of the manuscript that exactly matches the disk file must be supplied. Academic Press will not accept disks without accompanying printouts of all files on the disk. File names must clearly indicate the content of each file. The manuscript will be edited according to the style of the journal, and the proofs must be read carefully by the author. Disks that are not translatable or economical to process will not be used. The publisher reserves the right not to use the disk.

For further information on preparing disk for typesetting conversion, please contact the publisher (Editorial Supervisor, Journal Division, Academic Press, Inc., 1250 Sixth Avenue, San Diego, California 92101; telephone: (619) 699-6415; fax: (619) 699-6800).

List of Symbols. For manuscripts with typed mathematics, and where standard symbols are used, a symbols list is not required. If the text or equations contain any unusual or handwritten symbols, please attach to the manuscript a complete list of these symbols, handwritten or typed to agree with their appearance in the manuscript. Identify the symbols typographically, not mathematically. This list will not appear in print but is essential in order to avoid costly author's corrections in proof. Distinguish between "oh," "zero"; "ell," "one"; "kappa," "kay"; upper- and lowercase "kay"; etc. Indicate also when special type is required (German, Greek, vector, scalar, script, etc.); all other letters will be set in *italic*.

Figures should be numbered consecutively with Arabic numerals in order of mention in the text; each figure should have a descriptive legend. Legends should be typed together on a separate sheet, double-spaced. All figures and illustrations are to be submitted in such form as to permit photographic reproduction without retouching or redrawing. Lettering on drawings should be of professional quality or generated by *high-resolution* computer graphics and should be large enough (10–12 points) to take a reduction of 50–60%. Drawings should be made with black India ink on tracing linen, smooth-surface white paper, or Bristol board, no larger than 8.5 × 11.5-inches overall (21 × 27.5 cm). Alternatively, *high-quality* computer graphics may be acceptable. Graph paper, if used, should be ruled in blue. High-quality glossy prints are acceptable. **Photocopy prints are not acceptable;** however, copies of figures must be included in each copy of the manuscript.

Tables. Number tables consecutively with Roman numerals. Extensive tables will be reproduced photographically and so should be typed carefully and in the *exact* format desired. Authors will be charged for any new photoreproductions necessitated by changes in proof. Use superscript lowercase italic letters for footnotes and type immediately below the table. Type tables double-spaced, including titles and footnotes. Do *not* underline table titles; reserve underlining for text that is to be *italicized*.

Equations should be typewritten and the number in parentheses at the right margin. Reference to equations should use the form “Eq. (3)” or simply (3). Superscripts and subscripts should be typed or handwritten clearly above and below the line, respectively. Use the exponent $^{1/2}$ wherever possible.

“Style.” In general, authors should be guided by the *Style Manual*, 1990, of the American Institute of Physics, 335 East 45 Street, New York, NY 10017, **but**

References should be styled and punctuated according to the following examples:

1. H. D. SIVAK, *Ann. Phys. (N.Y.)* **159** (1985), 351.
2. G. B. ARFKEN, “Mathematical Methods for Physicists,” 3rd ed., p. 20, Academic Press, New York, 1985.
3. J. M. AITKEN AND E. A. IRENE, in “Treatise on Materials Science and Technology” (H. Herman, Ed.), Vol. 24, p. 50, Academic Press, New York, 1985.

Cite references in the text by an Arabic numeral between square brackets, as [1], [1, 2], [1, Theorem 1.5], etc. Type references consecutively on a separate page, double- or triple-spaced throughout.

Footnotes in text should be avoided if at all possible. If they must be used, identify by superscript numbers and type together on a separate page, double- or triple-spaced.

Proofs. Proofs will be sent to the author, with a reprint order form. Authors will be charged for alterations in excess of 10% of the cost of composition.

Reprints. Fifty reprints without covers will be provided free of charge. Additional reprints may be purchased; an order form will be included with the proofs.